

## **EXHIBIT 43**

# Melton v GM

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# Summary

- Obtained ignition switches from third-parties as well as from salvage yard steering columns
- Conducted ignition switch torque analysis both in-vehicle and on lab bench
- Torque analysis conducted using two methods:
  - Torque gauge to measure maximum torque for given position bounds (e.g., run/acc)
  - Torque transducer and linear potentiometer to measure torque vs angle
- Ignition switch torque analysis revealed certain ignition switches did not meet specifications
- X-Ray and ignition switch inspections revealed a design change in ignition switch part #10392423 between 2006 and 2007 MY Cobalts
- Analyzed warranty repair data for BCM and ignition switch/steering column repairs

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# Cobalt and ION Ignition Switch Torque Analysis

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# Torque Analysis Summary

- Obtained ignition switches from third-parties as well as from steering columns found in salvage yards
- Conducted ignition switch torque analysis using two methods:
  1. Used torque gauge to measure maximum torque for given position bounds (e.g., run/acc)
    - Testing was performed both in-vehicle and on lab bench. Did not observe significant differences in torque measurements.
  2. Used torque transducer and linear potentiometer to measure torque vs angle for entire ignition switch range of rotation
    - Testing was performed on lab bench only.
- Torque analysis revealed certain ignition switches from 05-06 Cobalts and 03 ION did not meet specifications

# Steering Columns/Ignition Switches Obtained from Salvage Yards

| Model    | Year | # Steering Columns Obtained |
|----------|------|-----------------------------|
| Cobalt   | 2005 | 5                           |
|          | 2006 | 4                           |
|          | 2007 | 4                           |
|          | 2008 | 3                           |
|          | 2009 | 2                           |
| ION      | 2003 | 2                           |
|          | 2004 | 2                           |
|          | 2005 | 2                           |
|          | 2006 | 3                           |
|          | 2007 | 1                           |
| HHR      | 2006 | 2                           |
|          | 2007 | 2                           |
| Solstice | 2006 | 1                           |
|          | 2007 | 2                           |
| G5       | 2007 | 2                           |
| Total    | -    | 37                          |



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# Torque Gauge Measurements (Steering Columns from Salvage Yards)

| Model Year | Model & VIN     | P/N      | Cap Size | Off to Acc (N-cm) | Acc to Run (N-cm) | Run to Start (N-cm) | Run to Acc (N-cm) | Acc to Off (N-cm) |
|------------|-----------------|----------|----------|-------------------|-------------------|---------------------|-------------------|-------------------|
| 2005       | Cobalt VIN 1306 | 10392423 | Short    | 2.8               | 7.4               | 50.9                | -6.0              | -6.7              |
| 2005       | Cobalt VIN 2380 | 10392423 | Short    | 3.2               | 7.8               | 48.0                | -7.8              | -8.1              |
| 2006       | Cobalt VIN 7326 | 10392423 | Short    | 2.1               | 7.8               | 50.9                | -7.1              | -8.1              |
| 2006       | Cobalt VIN 6342 | 10392423 | Short    | 2.1               | 8.5               | 50.9                | -7.8              | -8.5              |
| 2007       | Cobalt VIN 9561 | 10392423 | Long     | 3.5               | 19.8              | 50.9                | -16.2             | -16.2             |
| 2008       | Cobalt VIN 4195 | 15886190 | Long     | 5.3               | 19.8              | 48.0                | -22.6             | -22.6             |
| 2008       | Cobalt VIN 0386 | 15886190 | Long     | 4.9               | 17.0              | 48.0                | -19.8             | -22.6             |
| 2009       | Cobalt VIN 3438 | 15886190 | Long     | 3.2               | 19.8              | 53.7                | -15.5             | -15.9             |

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# Torque Gauge Measurements (Cobalt Switches from Third Parties)

| Model Year(s) | Manufacturer    | P/N      | Off to Acc (N-cm) | Acc to Run (N-cm) | Run to Start (N-cm) | Run to Acc (N-cm) | Acc to Off (N-cm) |
|---------------|-----------------|----------|-------------------|-------------------|---------------------|-------------------|-------------------|
| 2008-2010     | AC Delco        | 15886190 | 6.0               | 22.6              | 45.2                | -22.6             | -22.6             |
| 2008-2010     | AC Delco        | 15886190 | 6.2               | 22.6              | 45.2                | -22.6             | -22.6             |
| 2008-2010     | Auto Parts      | 15886190 | 2.3               | 16.4              | 39.6                | -14.8             | -16.6             |
| 2007          | AC Delco        | 10392423 | 10.6              | 19.8              | 45.2                | -22.6             | -20.9             |
| 2009          | AC Delco        | 10392423 | 5.7               | 19.8              | 53.7                | -22.0             | -22.0             |
| 2005-2010     | Napa Auto Parts | KS7138   | 6.7               | 19.8              | 50.9                | -16.4             | -22.6             |
| 2010          | AC Delco        | 10392423 | 5.7               | 19.8              | 50.9                | -22.6             | -22.6             |
| 2005          | Duralast        | L1328    | 8.8               | 17.0              | 45.2                | -22.0             | -28.3             |
| 2008          | Duralast        | LS1497   | 6.4               | 17.0              | 42.4                | -17.0             | -17.0             |
| 2005          | CarQuest        | 53-27479 | 6.0               | 28.3              | 56.5                | -17.0             | -22.6             |
| 2005, 2008    | BWD             | CS1138   | 6.4               | 17.0              | 53.7                | -17.0             | -28.3             |
| 2009          | AC Delco        | 15886190 | 6.4               | 19.8              | 50.9                | -19.8             | -22.6             |
| 2010          | AC Delco        | 1566190  | 5.7               | 19.8              | 53.7                | -22.6             | -22.6             |
| 2005          | AC Delco        | 10392423 | 7.1               | 19.8              | 48.0                | -22.6             | -25.4             |
| 2011          | AC Delco        | 20939745 | 2.1               | 19.8              | 56.5                | -33.9             | -22.6             |
| 2005          | ??              | 10392423 | 3.2               | 7.8               | 48.0                | -7.8              | -8.1              |
| 2008          | ??              | 15886190 | 4.9               | 17.0              | 48.0                | -19.8             | -22.6             |

Cobalt Switches from Salvage Yard  
Steering Columns for Comparison

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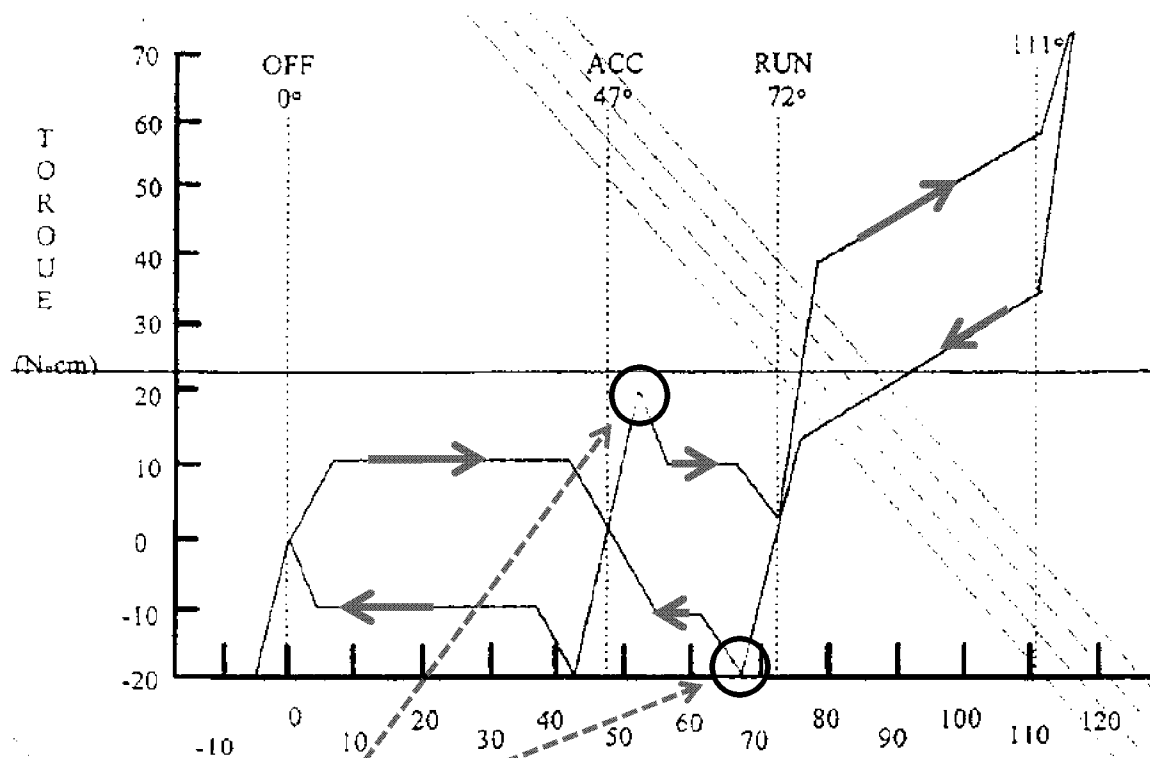
# Measurement Method Comparison

| Vehicle                 | Acc to Run             |                              | Run to Acc             |                              |
|-------------------------|------------------------|------------------------------|------------------------|------------------------------|
|                         | Torque Gauge<br>(N-cm) | Torque + Angle DAQ<br>(N-cm) | Torque Gauge<br>(N-cm) | Torque + Angle DAQ<br>(N-cm) |
| 2006 Cobalt<br>VIN 6342 | 8.5                    | 7.7                          | -7.8                   | -6.9                         |
| 2006 Cobalt<br>VIN 7326 | 7.8                    | 6.8                          | -7.1                   | -7.3                         |
| 2007 Cobalt<br>VIN 9561 | 19.8*                  | 15.7                         | -16.2*                 | -15.0                        |
| 2008 Cobalt<br>VIN 4195 | 19.8*                  | 18.9                         | -22.6*                 | -17.5                        |
| 2009 Cobalt<br>VIN 3438 | 19.8*                  | 18.8                         | -15.5*                 | -15.3                        |
| 2003 ION<br>VIN 3016    | -                      | 10.5                         | -                      | -8.7                         |
| 2005 ION<br>VIN 7696    | -                      | 18.1                         | -                      | -16.2                        |

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\*Torque gauge used for this range of torques has lower resolution.

# Specification

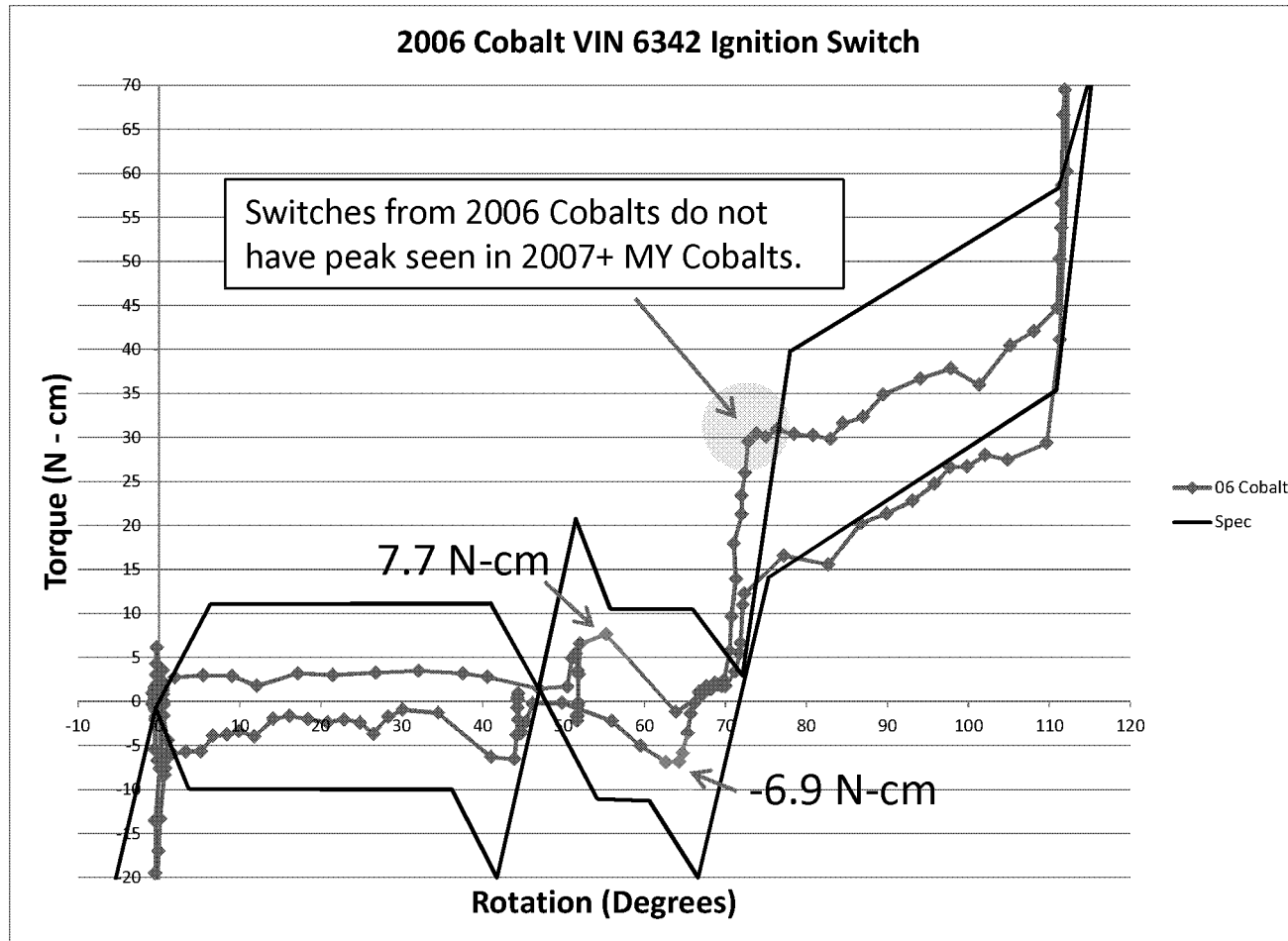


20 +/- 5 N-cm specification for

- Acc → Run
- Run → Acc

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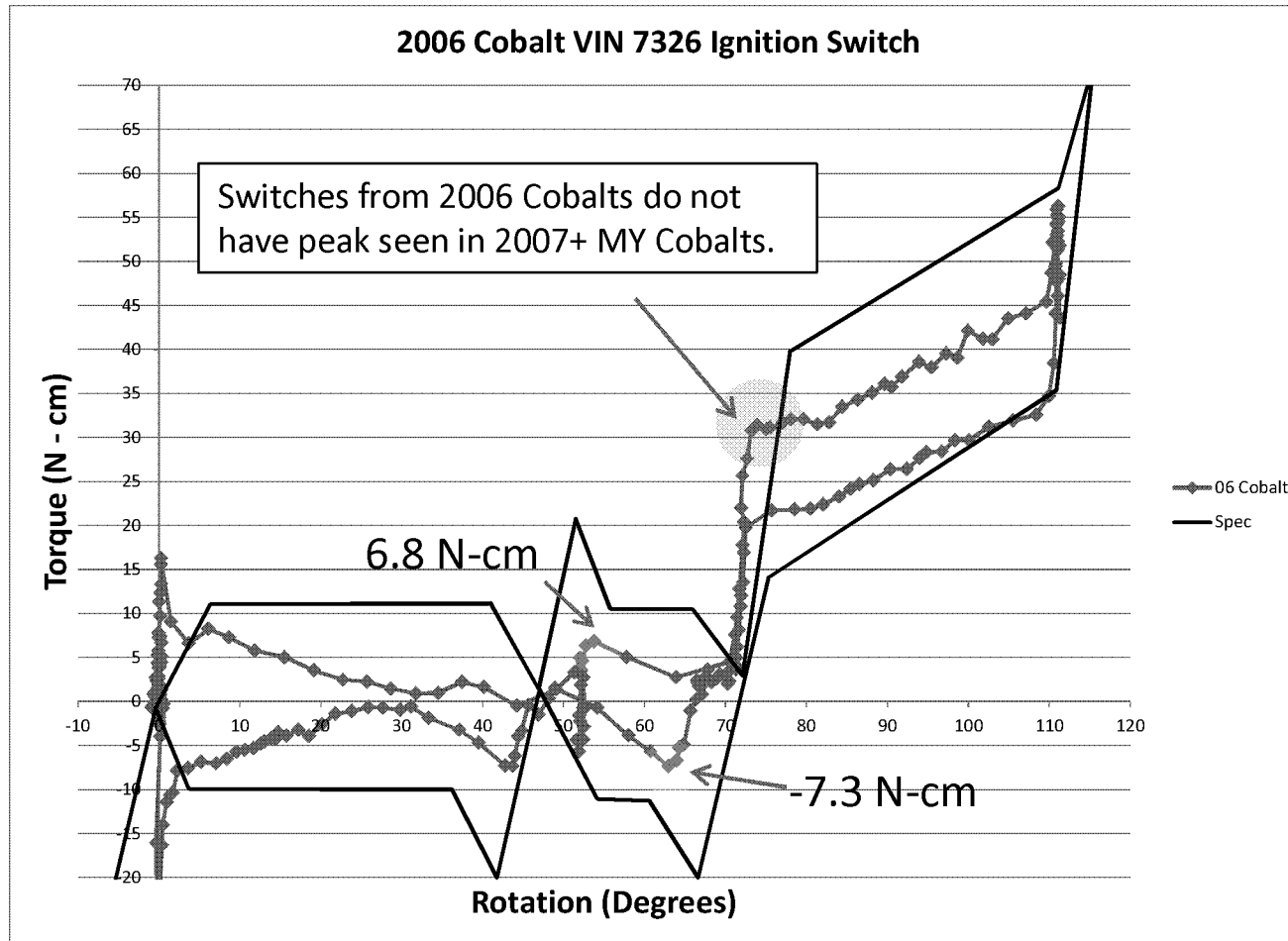
# Torque vs Angle Measurements



Does not meet Run/Acc spec.

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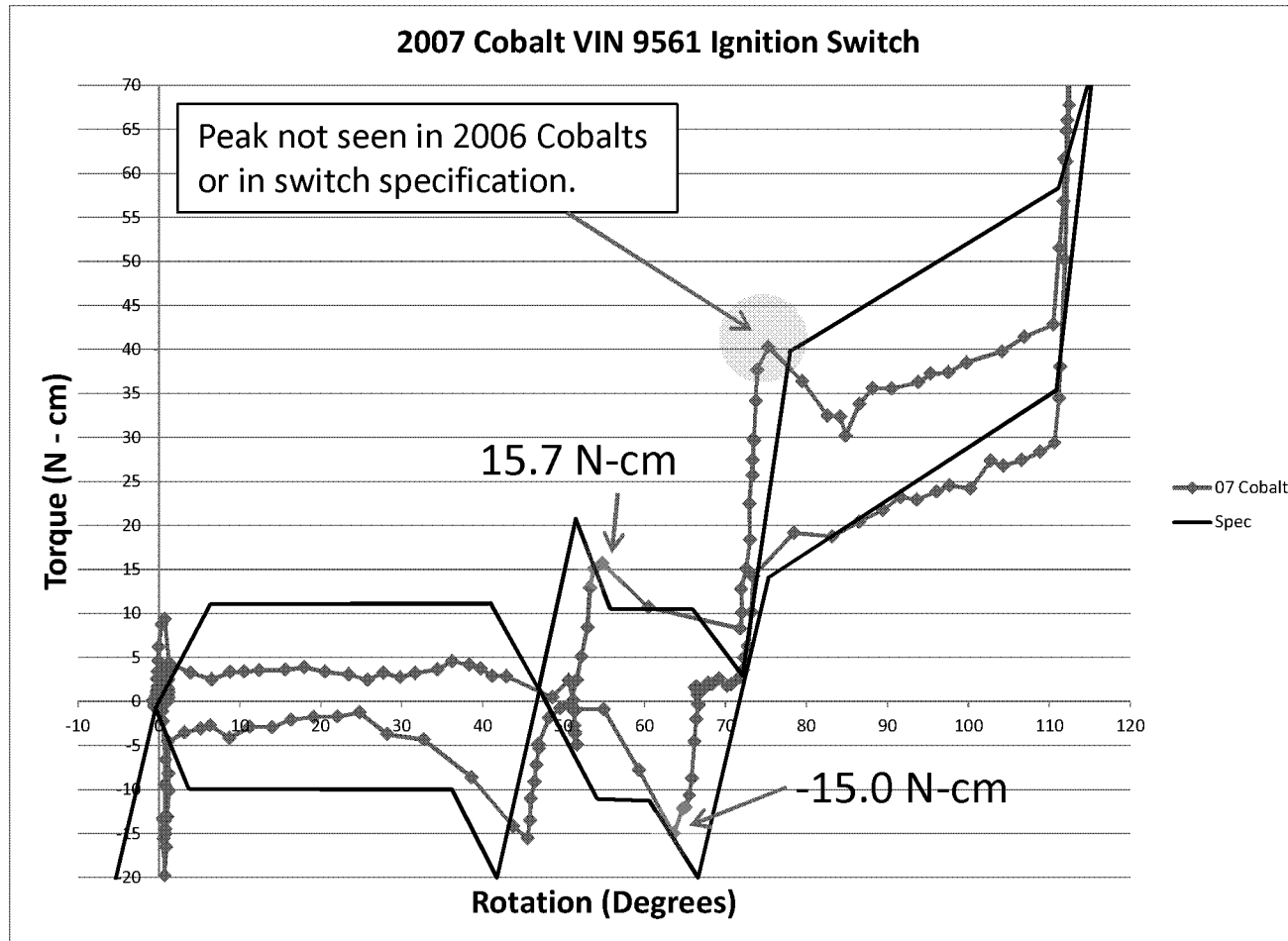
# Torque vs Angle Measurements



Does not meet Run/Acc spec.

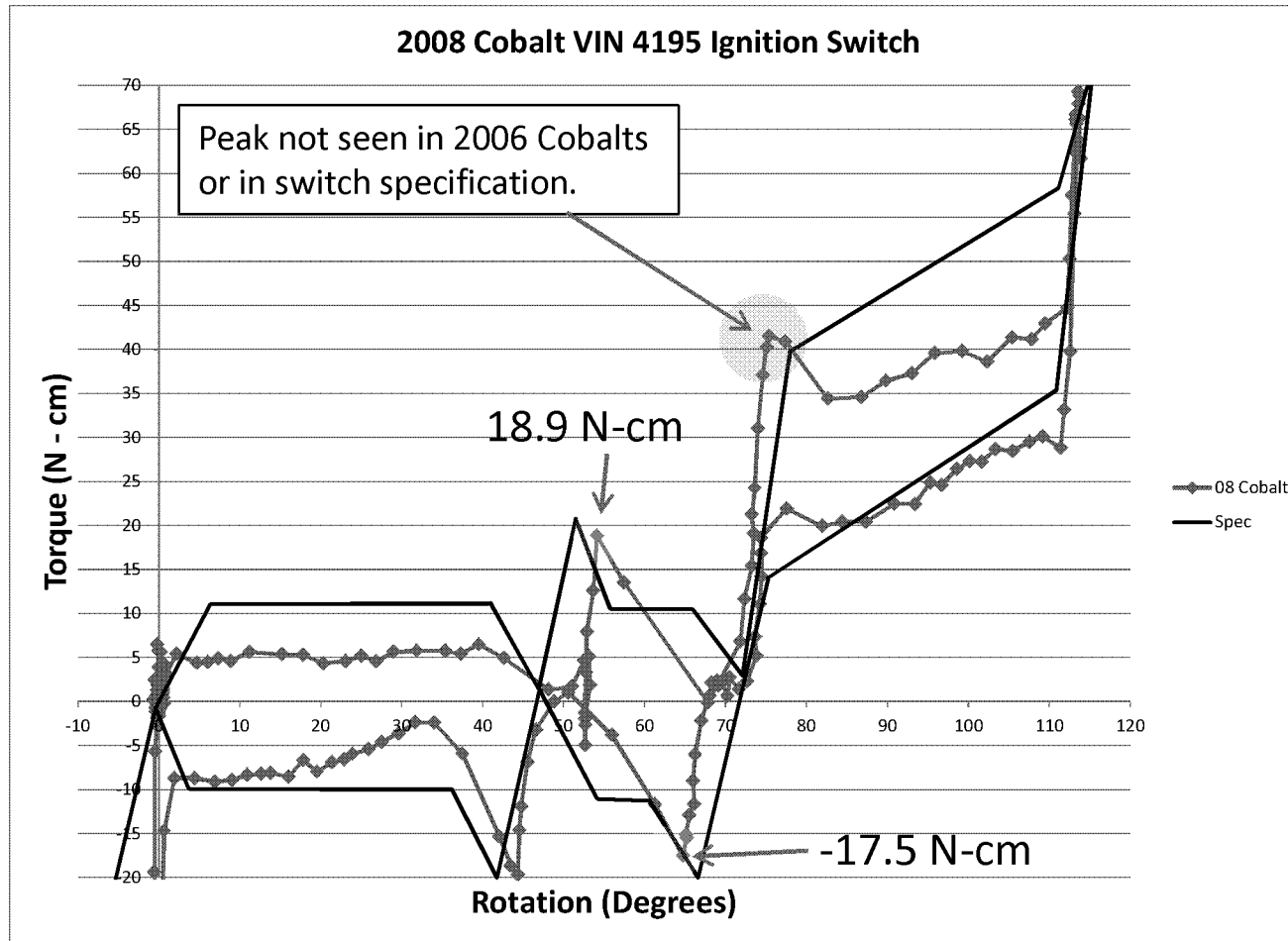
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# Torque vs Angle Measurements



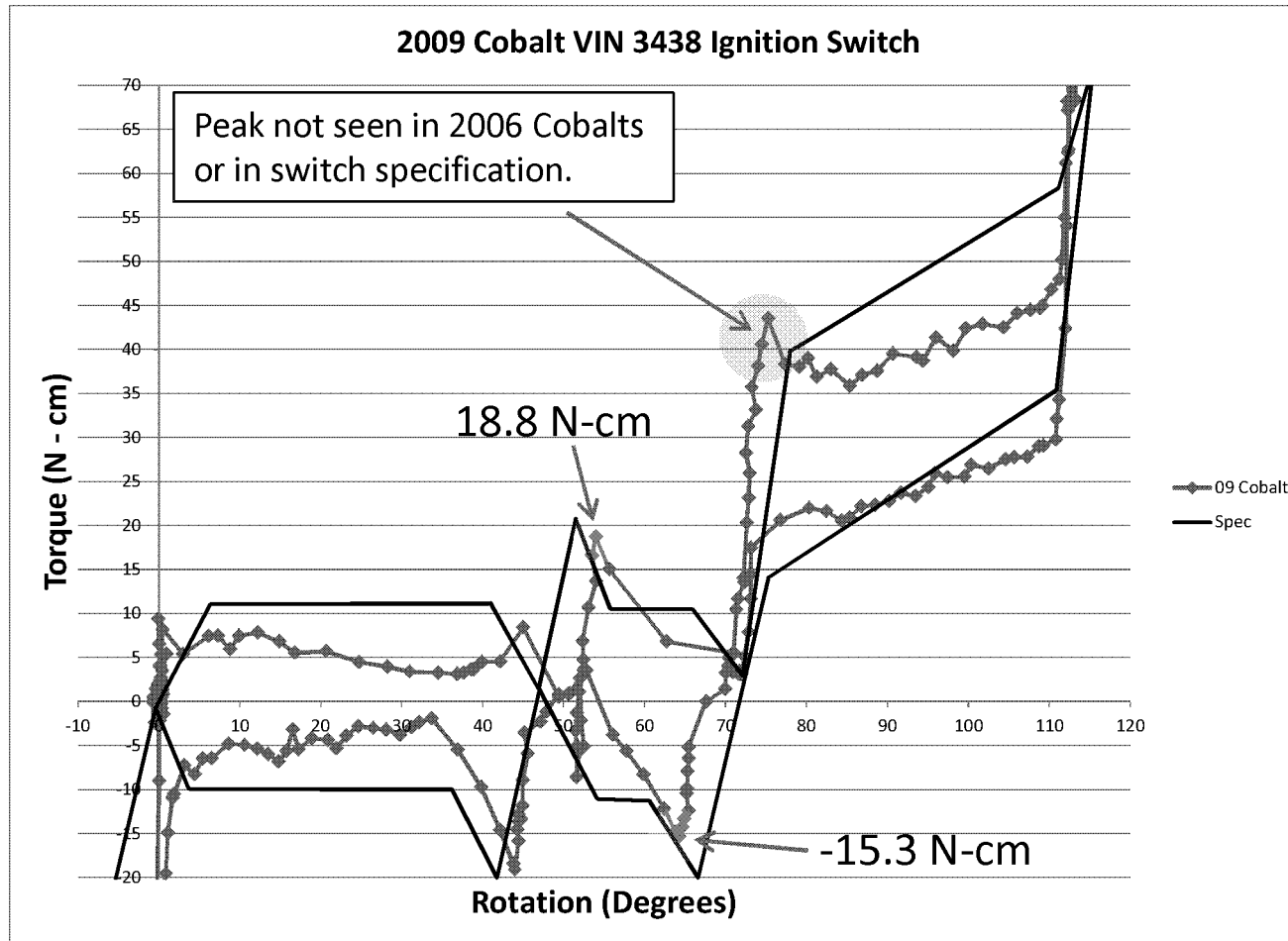
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# Torque vs Angle Measurements



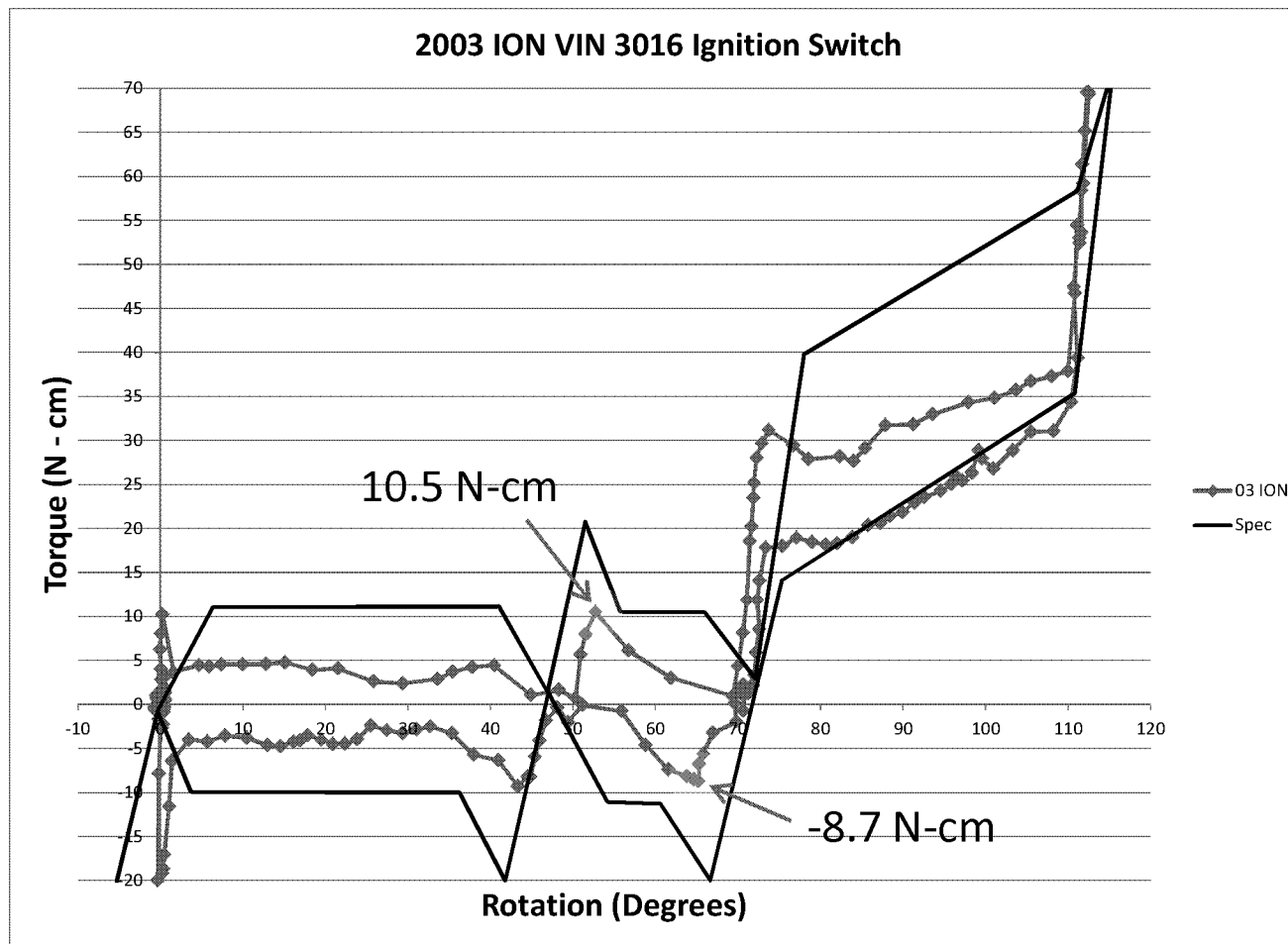
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# Torque vs Angle Measurements



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# Torque vs Angle Measurements

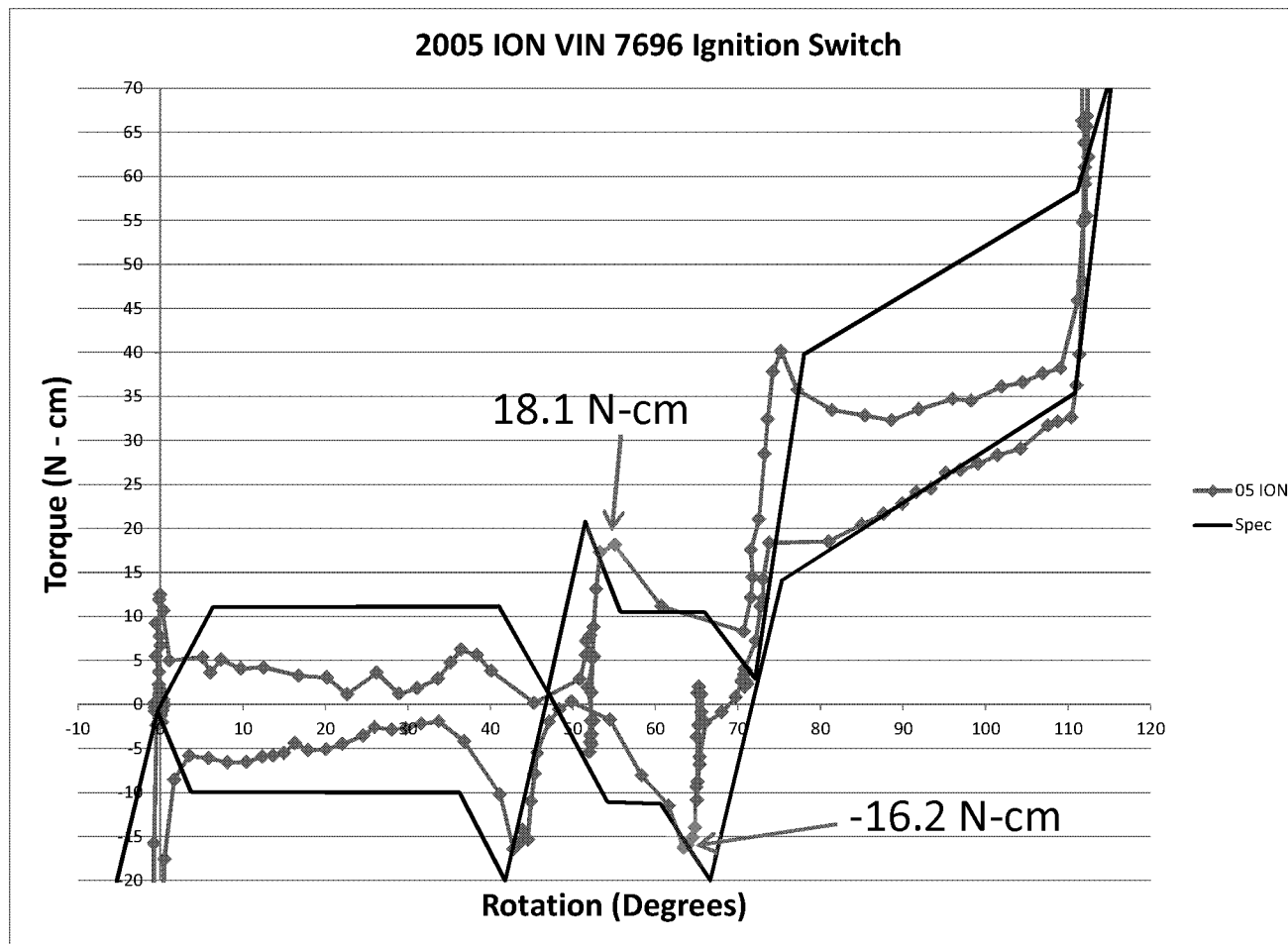


Does not meet Run/Acc spec.

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# Torque vs Angle Measurements

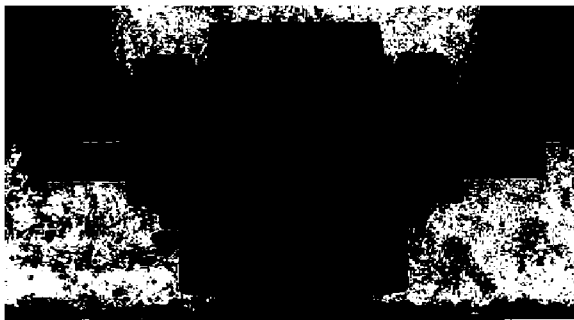


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# X-Ray Comparison of Ignition Switches

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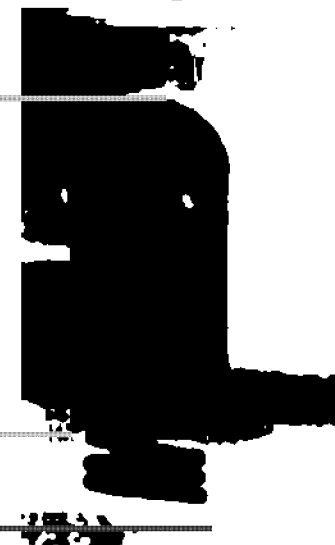
2005 Salvage Yard Cobalt



2008 Salvage Yard Cobalt



2005-2007 AC Delco



- 12 spring coils
- Run to Acc: -7.7 N-cm
- Cap is shorter than observed in MY 07+ and aftermarket switches

- 15 spring coils
- Run to Acc: -22.6 N-cm

- 14 spring coils
- Run to Acc: -22.6 N-cm

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\*images are to scale relative to each other

# Torque Measurements

| Switch (All from salvage yards) | P/N (#)  | PCB Production Date* | Cap Size | Model Year | Off to Acc (N-cm) | Acc to Run (N-cm) | Run to Start (N-cm) | Run to Acc (N-cm) | Acc to Off (N-cm) |
|---------------------------------|----------|----------------------|----------|------------|-------------------|-------------------|---------------------|-------------------|-------------------|
| 05 Cobalt -2380                 | 10392423 | NS 04 34             | Short    | 2005       | 3.2               | 7.8               | 48.0                | -7.8              | -8.1              |
| 05 Cobalt - 1306                | 10392423 | NS 04 48             | Short    | 2005       | 2.8               | 7.4               | 50.9                | -6.0              | -6.7              |
| 06 Cobalt - 7326                | 10392423 | NS 05 43             | Short    | 2006       | 2.1               | 7.8               | 50.9                | -7.1              | -8.1              |
| 06 Cobalt - 6342                | 10392423 | NS 05 12             | Short    | 2006       | 2.1               | 8.5               | 50.9                | -7.8              | -8.5              |
| 07 Cobalt - 9561                | 10392423 | ??                   | Long     | 2007       | 3.5               | 19.8              | 50.9                | -16.2             | -16.2             |
| 09 Cobalt -3438                 | 15886190 | ??                   | Long     | 2009       | 3.2               | 19.8              | 53.7                | -15.5             | -15.9             |
| 08 Cobalt - 0386                | 15886190 | ??                   | Long     | 2008       | 4.9               | 17.0              | 48.0                | -19.8             | -22.6             |

\*Date observed on PCB silkscreen

- Format NS XX YY: XX is year and YY is week

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# Detent Spring X-Rays

2005 Cobalt VIN 1306



- 13 Coils
- Run to Acc: -6.0 N-cm
- NS 04 48 (PCB prod. date)

2006 Cobalt VIN 6342



- 12 Coils
- Run to Acc: -7.8 N-cm
- NS 05 12 (PCB prod. date)

2006 Cobalt VIN 7326

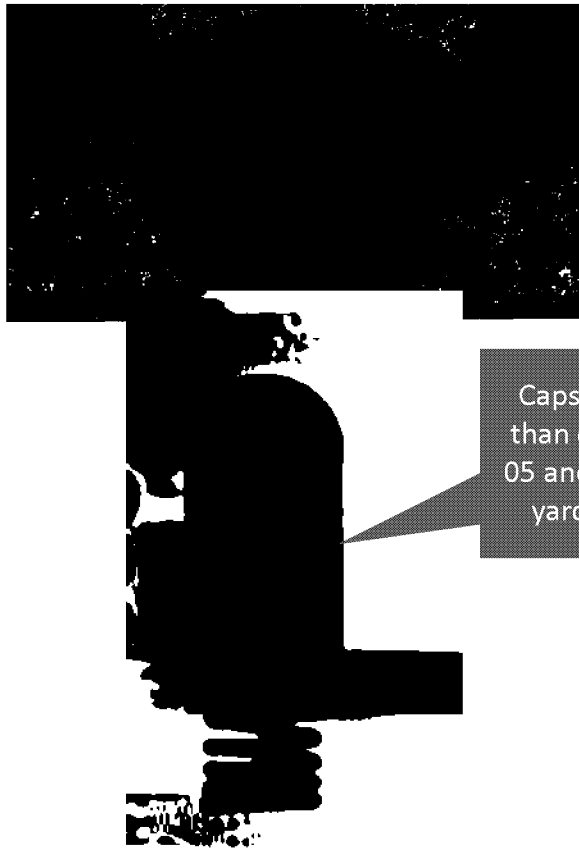


- 13 Coils
- Run to Acc: -7.1 N-cm
- NS 05 43 (PCB prod. date)

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# Detent Spring X-Rays

2007 Cobalt VIN 9561



- 16 Coils
- Run to Acc: -16.2 N-cm

2009 Cobalt VIN 3438



Caps are longer  
than observed in  
05 and 06 salvage  
yard switches

- 17 Coils
- Run to Acc: -15.5 N-cm

2005 Cobalt VIN 2380

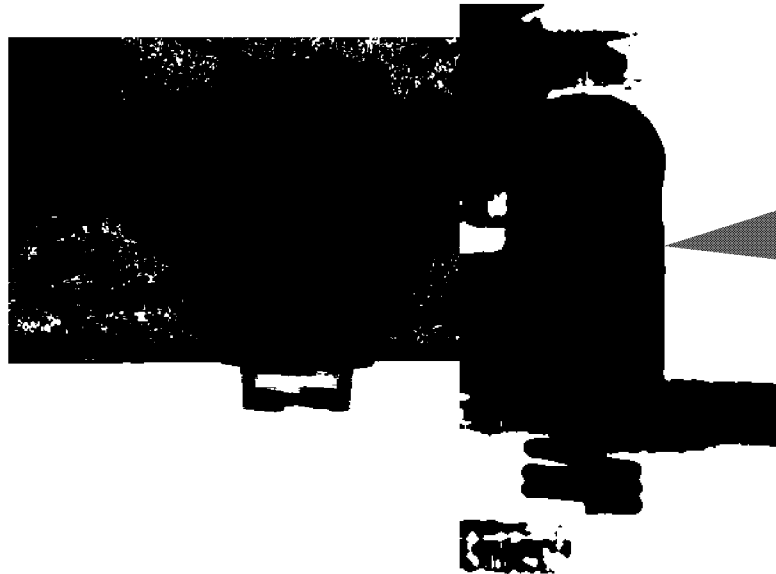


- 12 Coils
- Run to Acc: -7.8 N-cm
- NS 04 34 (PCB prod. date)

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# Detent Spring X-Rays

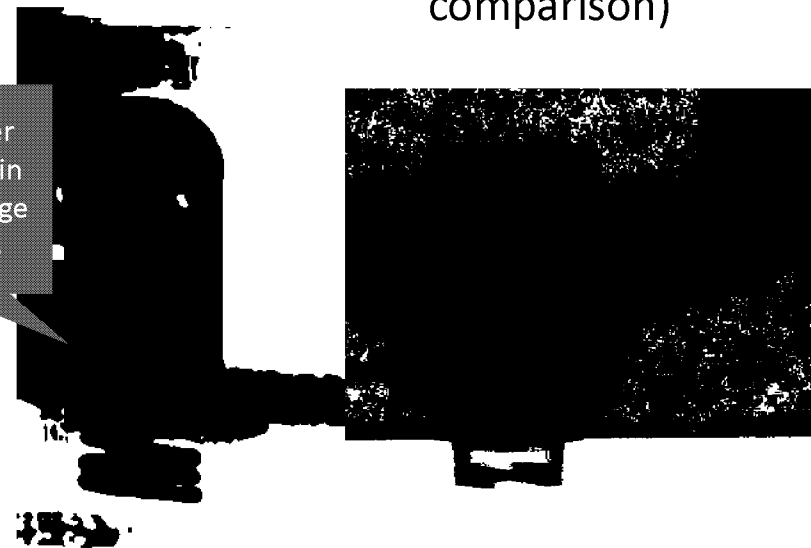
2008 Cobalt VIN 0386



- 15 Coils
- Run to Acc: -22.6 N-cm

AC Delco Aftermarket Switch  
for 2005 -2007 Cobalt (for  
comparison)

Caps are longer  
than observed in  
05 and 06 salvage  
yard switches

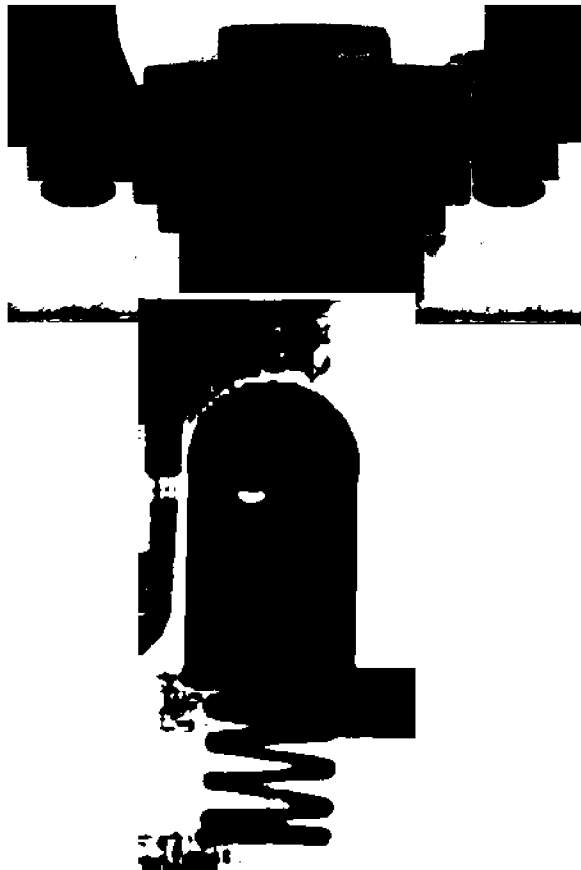


- 14 Coils
- Run to Acc: -22.6 N-cm

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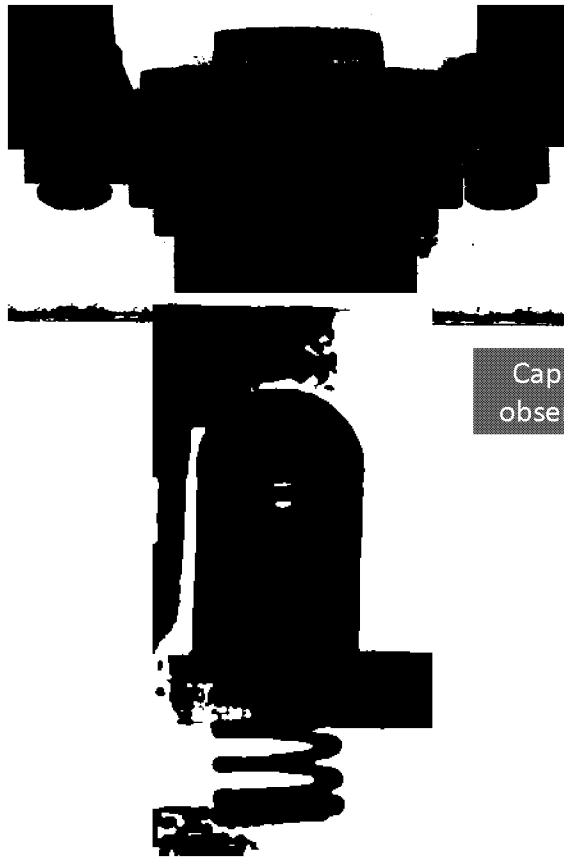
# Detent Spring X-Rays

2003 ION VIN 9476



- 12 Coils

2003 ION VIN 3016



- 12 Coils
- Run to Acc: -8.7 N-cm

2005 ION VIN 7696



- 16 Coils
- Run to Acc: -16.2 N-cm

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# Detent Spring X-Rays

## PCB Silkscreen

2003 Ion VIN 9476



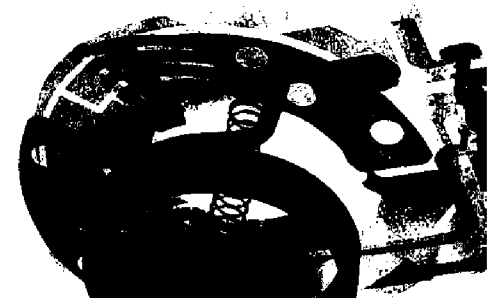
- NS 04 38 (PCB prod. date)
- Other markings:
  - 741 - 79244
  - REV G
  - 1 - 20

2003 Ion VIN 3016



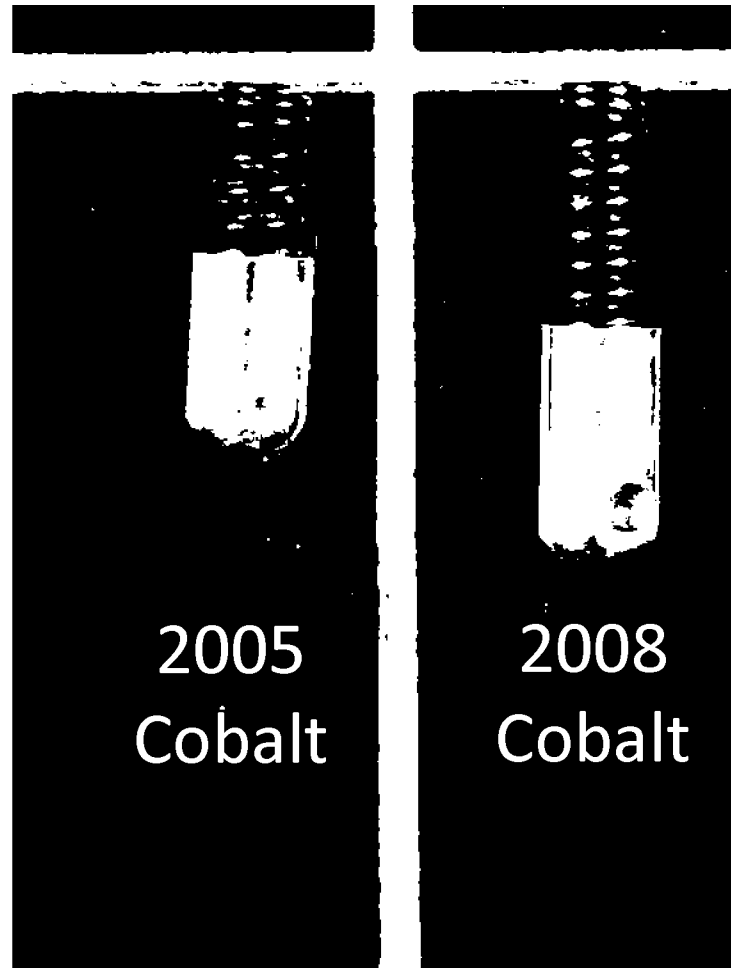
- No PCB prod. date
- Other markings:
  - 741 - 79244
  - REV G

2005 Ion VIN 7696



- No PCB prod. date
- Other markings:
  - 12861211
  - REV 05
- Records do not indicate ignition switch replaced

# Spring and Cap Comparison



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